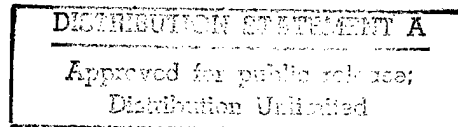




**US Army Corps  
of Engineers**



## **Profiling Private Dock and Marina-Slip Holders at Corps of Engineers Projects**

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### **Purpose**

The research being conducted under the Recreation Research Program (RRP), as part of the work unit "Measuring the Economic Effects of Boat Dock Permit and Marina-Slip Holders," is designed to estimate the economic impact of these populations on Corps of Engineers water resource projects. This technical note describes the two populations and the research effort.

### **Background**

Economic impact analysis is a tool that project managers can use to evaluate the effect of management alternatives on the economy of a region. By establishing a baseline of the number of visitors and their spending patterns, impacts to the regional economy in terms of jobs, sales, and income can be constructed using an input/output (I/O) model. Changes in management policies can result in changes in the amount of recreation use and the distribution of activities. For example, lower water levels can mean fewer boaters. However, on river corridors it can mean increased sandbar exposure and increased use by other groups such as rafters and canoeists. The change in the number of users or the composition of the activity spectrum can be used to estimate the effect of the policy on the economy.

Additionally, as required by the Federal Water Project Recreation Act (Public Law 89-72; U.S. Congress 1965), the Corps must have partners to share the cost for any future public recreation development. It is in the Corps' best interest to gain an understanding of the economic benefits of its contribution to public recreation and to make that information known to potential cost-sharing partners and industries with interests in the same customer.

Figure 1 depicts the process of conducting a typical economic impact analysis. The key components of an economic impact assessment are estimates of use and visitor

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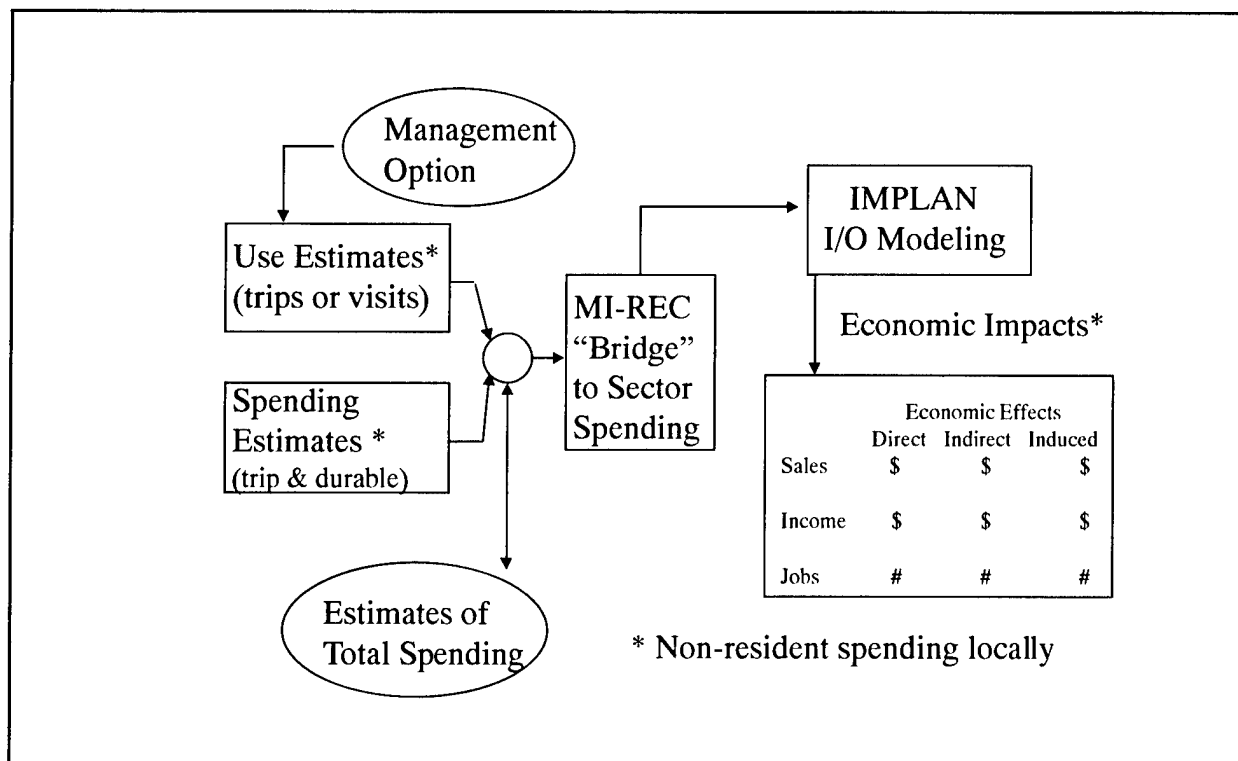


Figure 1. Economic impact overview

spending allocated into sectors of the economy through a bridge table and processed through an I/O model. Management options can then be evaluated to determine changes in a regional economy based on changes in visitor use.

To date, economic impact research efforts conducted by the Corps have focused on developed recreation areas (Jackson and others 1992; Propst, Stynes, and Jackson 1992; Propst and others 1992). From this work, it was demonstrated that the spending profiles of boaters were higher than those of non-boaters for all but one of the six comparable groups (Figure 2).

Previous research conducted under the RRP was not designed to study visitors to marinas as a separate group. It is likely that these visitors have significantly different spending patterns than other developed recreation area boaters and other visitors (Propst and others 1992, Stynes and others 1983). Another group of boaters that was not previously studied is those who occupy households adjacent to Corps projects. An identifiable subgroup of adjacent households with access to water resources is those with private dock permits. Those households without dock access would be more likely to use developed recreation area ramps to access the water and would have been a segment of the developed area studies conducted previously. Thus, they are not included in this effort.

## *Trip Spending (\$) Per Visit*

### *Developed Recreation Areas*

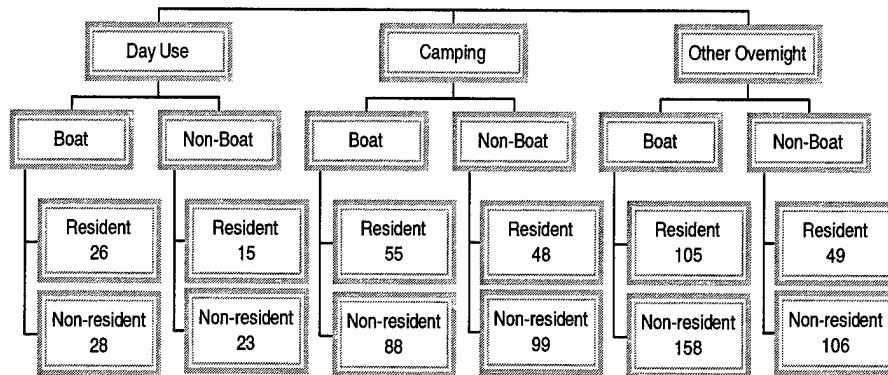


Figure 2. Trip spending per visit, Corps developed area (Propst and others 1992)

## Research Objectives

The objectives of this study are to develop an economic impact assessment procedure for the populations of interest and to measure the economic effects of recreation use associated with Corps dock-permit households and marina-slip renters.

## Delimitations

Other boating populations that occur on Corps projects are not included in this study. Those boating populations that are not currently reported for the Natural Resources Management System are not included. (The NRMS is a Corps of Engineers database that is maintained by Mr. Michael Owen of the U.S. Army Engineer District, Fort Worth.) These populations include users of private and public facilities on riverways and visitors who use lands under real estate leases that are not a part of the NRMS record.

## Study Populations

To sample dock-permit households and marina-slip renters, it is necessary to assemble information for profiling the characteristics of these populations. The baseline information for this technical note comes from the NRMS for the years 1984, 1987, and 1996. No other suitable sources of nationwide dock permit or marina data were available.

Because of the recent changes in the organizational structure of the Corps and limitations of the NRMS database, the information is being presented on a state basis rather than across Corps districts or divisions. Estimates placed in the database are used in this technical note to help understand the nature of the populations under study. Refinements will be made during the data collection effort.

The 1996 NRMS recorded information on 456 water resource projects. Of these, 386 (85%) are located entirely within a single state. However, 64 (14%) are located within two states, while 6 (1%) have project boundaries extending across three states. The information presented here is based on the primary state reported, meaning that for 15 percent of the projects, allocations of docks and marinas presented were made to the primary state. Reporting will not reflect the percentage of docks or marinas that were located in the secondary or tertiary state.

### **Private-Dock Permits**

The Corps offers several types of permits to provide boat access to projects. Three of the categories noted in the NRMS (DOCKS database) were private docks, community docks, and other floating facilities. State totals for these three permit types are shown in Table 1. Comparing these three permit categories for 1984 (the first year NRMS data were available), 1987 (10 years ago), and 1996 (the last reporting year), an upward trend is exhibited (Figure 3). This represents an overall 28-percent increase in private docks from 1984 to 1996 and a 15-percent increase in community docks for the same time period. In the last 10 years, the NRMS has reported a 16-percent increase in private docks and a 13-percent increase in community-dock permits.

For the 1996 reporting year, private-dock permits were the most numerous (31,974 or 87%), followed by community docks (3,752 or 10%) and floating facilities (1,189 or 3%). However, when the estimated numbers of boats accommodated by community docks (17,432) and private docks (46,273) were compared, community-dock permits represented 27 percent of the total number of boats associated with permits. To use the "permit" as the unit to be sampled, it will be necessary to address differences in the number of boats, and perhaps households, represented by the community dock group.

A review of the NRMS definitions reveals that "other floating facilities" includes "mooring buoys, mooring posts, swim floats, ski jumps, ski courses, etc." It is possible that these permits may be issued to households already represented by the private dock and community dock category. The category would require a separate stratum for sampling purposes. Because of funding limitations and the relative importance of this category, it is uncertain at this time if the effort required to obtain this information is warranted.

A review of the distribution of dock permits by state indicates that one project clearly dominates the category. A list of the 10 states with the greatest number of dock permits is provided as Table 2. A greater number of private docks was located on Lake Sidney Lanier than at any other Corps project. As a result, the State of Georgia records more than 52 percent of all dock permits issued by the Corps—more than all other Corps projects combined. Community-dock permits were more geographically dispersed, with Missouri, Kentucky, and Arkansas as leaders in this permit category.

**Table 1. Corps Dock Permits and Marina Slips – By State**

State	No. Projects	Private Docks	Private Boats	Community Docks	Community Boats	Floating Facilities	Concessions Dry Slips   Wet Slips		Total Concessions
AK	1	0	0	0	0	0	0	0	0
AL	4	0	0	0	0	0	0	51	51
AR	27	1,464	2,215	703	2,741	174	629	10,613	11,242
AZ	2	0	0	0	0	0	0	0	0
CA	23	0	0	0	0	0	55	1,827	1,882
CO	5	5	5	5	5	5	27	219	246
CT	8	—	—	—	—	—	—	—	0
FL	5	843	904	0	0	0	959	971	1,930
GA	9	16,730	25,513	145	975	66	3,403	10,227	13,630
IA	6	147	168	5	16	49	80	336	416
ID	3	0	0	0	0	0	—	—	0
IL	10	254	254	234	242	0	1,294	2,406	3,700
IN	11	0	0	8	196	0	130	2,690	2,820
KS	17	289	371	0	0	6	522	1,927	2,449
KY	22	1,267	1,898	806	4,150	6	299	5,447	5,746
LA	7	0	0	0	0	0	54	412	466
MA	13	—	—	—	—	—	0	0	0
MD	1	0	0	0	0	0	—	—	0
MI	2	—	—	—	—	—	—	—	0
MN	12	140	155	0	0	2	0	742	742
MO	13	1,148	1,362	1,188	5,529	21	1,809	6,560	8,369
MS	6	5	4	1	30	18	193	2,090	2,283
MT	2	84	127	2	6	5	10	558	568
NC	4	102	102	0	0	0	0	339	339
ND	5	358	800	71	192	179	340	680	1,020
NE	15	8	9	0	0	0	50	647	697
NH	6	—	—	—	—	—	—	—	0
NM	7	24	36	0	0	30	0	191	191
NY	3	—	—	—	—	—	0	0	0
OH	31	428	993	33	560	0	1,920	5,940	7,860
OK	27	1,832	2,758	142	844	73	793	6,673	7,466
OR	17	40	120	5	88	1	20	727	747

(Continued)

Table 1. (Concluded)									
State	No. Projects	Private Docks	Private Boats	Community Docks	Community Boats	Floating Facilities	Concessions Dry Slips   Wet Slips		Total Concessions
PA	39	307	445	15	316	2	868	3,498	4,366
SC	1	1,199	922	216	772	37	261	612	873
SD	6	44	60	5	43	1	222	275	497
TN	6	2,286	2,528	38	129	7	822	8,820	9,642
TX	31	669	1,081	108	457	2	2,544	11,134	13,678
VA	6	2,087	3,118	15	75	417	268	851	1,119
VT	5	—	—	—	—	—	—	—	0
WA	11	42	81	7	17	4	291	660	951
WI	6	105	121	0	0	89	10	45	55
WV	21	72	128	5	54	0	324	1,098	1,422
Total	456	31,974	46,273	3,752	17,432	1,189	18,197	89,266	107,463

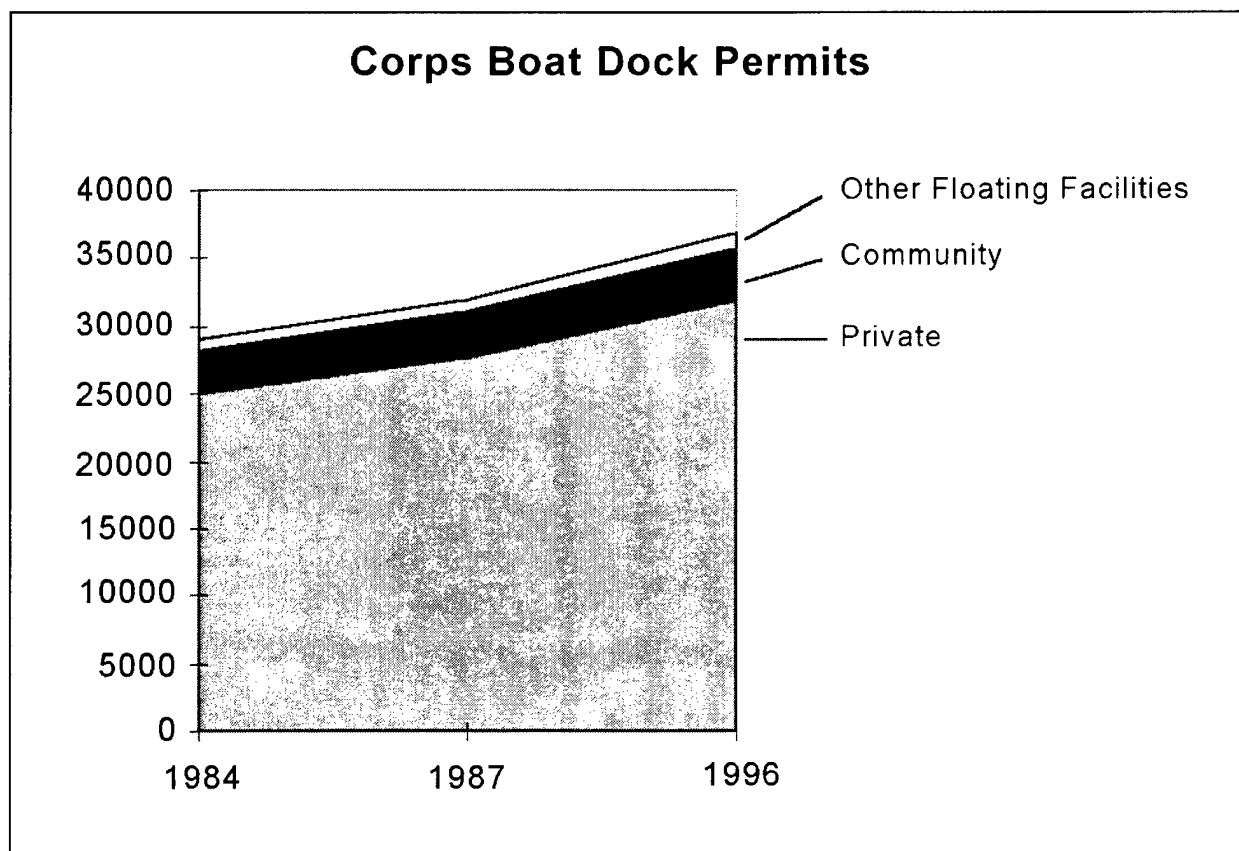


Figure 3. Trends in CE Boat Dock Permit Data (NRMS 1984, 1987, 1996)

**Table 2. State Distribution of Corps Dock Permits (1996 NRMS)**

Number of Corps Projects (Top Ten States)		Private Boat Docks (Top Ten States)    %		Community Docks (Top Ten States)    %	
PA	39	GA	52.3	MO	31.7
OH	31	TN	7.2	KY	21.5
TX	31	VA	6.5	AR	18.7
AR	27	OK	5.7	IL	6.2
OK	27	AR	4.6	SC	5.8
CA	23	KY	4.0	GA	3.9
KY	22	SC	3.8	OK	3.8
WV	21	MO	3.6	TX	2.9
KS	17	FL	2.6	ND	1.9
OR	17	TX	2.1	TN	1.0

### Marina Slips

Information on marina slips maintained at Corps water resource projects is found within the NRMS concession (CONCESN) database. Two variables were of interest: wet (BOAT\_MR\_WT) and dry (BOAT\_MR\_DR) moorings. Data for these permits were summarized by state and are included in Table 1. The data in these fields were not comparable across the historic data files. A total of 685 concessionaires were listed within the 1996 database. Of these, 525 concessions reported dry or wet slip-storage maintained. Only 224 concessions maintained dry storage facilities, while 514 maintained slips on the water (Table 3). Of these 514 marina facilities, 28 (5%) were designated as "private" (for example, yacht club), with the remaining 486 designated as providing services to the public. The average size of a dry storage facility was just over 80 spaces, while the average wet mooring facility comprised more than 170 slips.

Table 4 lists the 10 states with the greatest number of dry and wet storage slips. The state assignments were a result of linking the concession (CONCESN) database with a project database (PR\_MAIN) to determine the state designation using the variable (KEYPROJ). Tables 1 and 4 are a result of that analysis. However, the results should be used with caution, as it appears that the "KEYPROJ" designations were not entirely correct in this database.

Table 5 list the concessions with 500 or more slips, ranked by the total number of dry and wet storage slips available. Within this grouping, eight concessions were located on Lake Sidney Lanier (GA), and Wolf Creek Dam-Lake Cumberland (TN) and Lake Texoma (TX) had three each. Only three concessions maintain facilities accommodating more than 1,000 boats. Two located on Lake Lanier had over 1,000 wet slips; the third

**Table 3. Distribution of Corps Dry and Wet Storage (1996 NRMS)**

Summary	Dry Storage	Wet Mooring	Description
Count	224	514	Number of concessions
Min.	1	3	Smallest facility (in slips)
Max.	648	1,794	Largest facility (in slips)
Mean	81	174	Average facility size (in slips)
Mode	20	120	Most frequently occurring facility size (in slips)
Median	40	128	Half the number of facilities below this size, half above (in slips)

**Table 4. State Distribution of Corps Dry and Wet Slips (1996 NRMS)**

Number of Projects (Top Ten States)		Concession Dry Slips (Top Ten States) %		Concession Wet Slips (Top Ten States) %	
PA	39	GA	18.7	TX	12.5
OH	31	TX	14.0	AR	11.9
TX	31	OH	10.6	GA	11.5
AR	27	MO	9.9	TN	9.9
OK	27	IL	7.1	OK	7.5
CA	23	FL	5.3	MO	7.4
KY	22	PA	4.8	OH	6.7
WV	21	TN	4.5	KY	6.1
KS	17	OK	4.4	PA	3.9
OR	17	AR	3.5	IN	3.0



**Table 5. Corps Concessions Serving More Than 500 Slips**

Project Name	Area Name	Dry Storage (in spaces)	Wet Mooring (in slips)	Total Storage Units	Percent Wet
Lake Sidney Lanier	Aqualand Marina	531	1,784	2,315	77
Lake Sidney Lanier	Holiday On Lanier	0	1,262	1,262	100
Lewisville Lake	East Hill	330	870	1,200	73
Lake Ouachita	Joplin	70	911	981	93
Lewisville Lake	Lewisville Lake Park	250	725	975	74
Monroe	Fairfax	100	871	971	90
Texoma Lake	Grandpappy Point	12	879	891	99
Texoma Lake	Highport	0	886	886	100
Grapevine Lake	Oak Grove	251	623	874	71
Senecaville Lake	Seneca Lake Park	500	370	870	43
Lake Sidney Lanier	Lan Mar Marina	355	508	863	59
Raystown Lake	Seven Points	287	513	800	64
Perry Lake	Rock Creek Marina	300	493	793	62
Atwood Lake	Atwood Park	250	500	750	67
Lake Sidney Lanier	Sunrise Cove Marina	20	694	714	97
Charles Mill Lake	Kimberling Park	130	570	700	81
Table Rock Lake	Charles Mill Pk	300	400	700	57
J Percy Priest Dam	Elm Hill	0	660	660	100
Canyon Lake	Cranes Mill	270	390	660	59
Lake Sidney Lanier	Bald Ridge Marina	0	652	652	100
Raystown Lake	Lake Raystown	0	650	650	100
Wolf Creek Dam	Conley Bottom Restort	30	620	650	95
Grapevine Lake	Silver Lake	183	467	650	72
Lake Sidney Lanier	Habersham Marina	648	0	648	0
Greers Ferry Lake	Eden Isle Dock	0	614	614	100
Lake Sidney Lanier	Lazy Days	590	20	610	3
Bull Shoals Lake	Bull Shoals	0	610	610	100
Lavon Lake	Collin	143	450	593	76
Lake Sidney Lanier	Gainesville Marina	264	309	573	54

*(Continued)*

Table 5. (Concluded)					
Project Name	Area Name	Dry Storage (in spaces)	Wet Mooring (in slips)	Total Storage Units	Percent Wet
Allatoona Lake	Red Top Mtn	4	550	554	99
Tom Jenkins Dam	State Park	0	553	553	100
Allatoona Lake	Allatoona Lndg	54	498	552	90
Mississippi River Pools 11-22 (10 L&D)	Mudlake Arhdmr	430	120	550	22
Harry S. Truman Dam	Sterett Creek	200	342	542	63
Allatoona Lake	Harbor Town Mar Inc.	56	482	538	90
Hartwell Lake	Portman Marina	30	500	530	94
Wolf Creek Dam	Jamestown Marina	29	500	529	95
Wolf Creek Dam	Wolf Creek	0	526	526	100
Piedmont Lake	Piedmont Park	275	250	525	48
Canyon Lake	Canyon	63	453	516	88
Foster Joseph Sayers Dam	Bald Eagle Stpk	144	368	512	72
Joe Pool Lake	Lynn Creek	40	466	506	92
Texoma Lake	Cedar Mills Resort	20	480	500	96

concession, located on Lewisville Lake (TX), was a combination of wet (73%) and dry storage.

## Economic Effects

Two separate sampling frames and related procedures will be developed, as the unit of analysis (permits, slips) varies for the dock and marina populations. Data will consist of four parts: a panel profile, estimates of recreation use, spending estimates, and economic effects analysis. Surveys will be used to profile visitors, along with estimates of their recreation use and spending.

Estimates of the economic impact of recreation programs are influenced by the quality of the recreation data and the input/output model used in the analysis. Without reasonable estimates of recreation use and spending, the quality of the estimates being developed is limited. Effort must be placed in developing credible estimates of recreation use and spending patterns.

Currently, data on recreation participation and spending estimates vary widely, requiring additional effort to substantiate. This need was reported in 1990 by Pedersen, who noted that the range in size of multipliers contained in I/O models is minimal for

a recreation analysis.<sup>1</sup> Pedersen recommended that improvements focus on developing recreation participation and spending data. He noted that sectoral multipliers that are generated by the I/O model IMPLAN (**I**mpact **A**nalysis for **P**lanning) range in size from 1 to 3 with little change. The estimates of recreation participation and spending are problems outside the model, and are the focus of this research.

Spending estimates are significant, because Americans spend more than any other group in the world. In 1995, consumer spending was estimated at \$3.3 trillion or over \$32,000 per household. For that year, households with an annual income of \$50,000 or more, representing 25 percent of all households, accounted for over 44 percent of consumer spending. Two groups (35- to 44-year-olds and 45- to 54-year-olds) had incomes above the average, and spending patterns to match. They comprised 41 percent of households but controlled 54 percent of the spending (Francese 1997).

Recreation spending by visitors to Corps projects has been identified as a significant source of economic activity for the United States. It was estimated that, in 1994, visitors spent \$10 billion (1994 dollars) to engage in recreation at Corps projects (Jackson, Stynes, and Carlson 1996). Boaters have a record of spending more than other visitors to Corps projects (Figure 2). Several characteristics of boaters provide insight into visitor spending. For example, Stynes and others (1983) determined that boat length was one characteristic that was a useful predictor of recreation spending behavior. These researchers also noted that marina boater spending differed from the average registered boat owner.

Two types of information on visitor spending will be generated in this study: trip and durable good spending. Trip spending is that spending associated with the individual trip or recreation visit (for example, lodging, food, and beverage). Durable good items (such as boating equipment) are those that are used for multiple recreation visits. Within each category (trip and durable), the spending location is determined as local (usually one county level or within 30 miles of a Corps project) or non-local. In addition, the permanent residence of the visitor is determined (within or outside the region). The categories of trip spending commonly used in recreation spending surveys include the following: lodging, food and beverages, auto and RV, boating, fishing, hunting, entertainment, and miscellaneous. This information will be obtained and reported for two groups (residents and non-residents), for spending both within and outside the region.

As presented in Figure 1, survey information on use patterns and spending is converted into data fields (sectors in a bridge table) required for the model. The model then uses the information to develop estimates of direct, indirect, and induced economic effects. These effects are presented in the form of jobs, sales, and income that are attributed to recreation visitor spending.

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<sup>1</sup> L. D. Pedersen. (1990). "Use of IMPLAN to estimate economic impacts stemming from outdoor recreation expenditures in the upper lake states," unpublished doctoral dissertation, Michigan State University, East Lansing, MI.

## Current and Future Work

The plan of study and literature search have been completed for this research project, although new sources of information will be sought throughout the study. Economic impact sources are constantly being updated and revised. Three sources are especially noteworthy:

"Recreation and Tourism Spending and Economic Impact," by Dr. Daniel Stynes  
[<http://www.msu.edu/user/stynes/mirec/index.htm>]

"Bibliography of Economic Impacts of Parks, Recreation and Tourism," by  
Wen-Huei Chang [<http://pilot.msu.edu/user/changwe4/bibli.htm>]

"Bibliography of Economic Impacts of Parks, Recreation, Tourism and Open  
Space," prepared by National Society for Park Resources  
[<http://www.nrpa.org/infoctr/biblio.htm>]

Telephone surveys will be used to develop recreation use estimates, and a pre-mailer will be used to collect spending profile data.

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